MARÍA MARTÍN-SEIJO[1], YOLANDA CARRIÓN MARCO[2]

Shaping wood: Woodworking during the Iron Age and Roman period in the northwest of the Iberian Peninsula

1 GEPN-Grupo de Estudos para a Prehistoria do Noroeste Ibérico. Dpto. Historia I. Universidade de Santiago de Compostela. Praza da Universidade s/n. 15782 Santiago de Compostela, Spain. maria.martin.seijo@gmail.com

2 Dpto. de Prehistòria i Arqueologia. Universitat de València. Avda. Blasco Ibáñez, 24, 46010 Valencia, Spain. Yolanda.carrion@uv.es

***Summary**: This article discusses several timber structures, wooden objects and manufacturing waste recovered from settlements and specialized production sites during the Iron Age and the Roman period in northwest Iberia. These archaeobotanical remains were preserved directly by carbonization, waterlogging and occasionally mineralization, as well as indirectly by impressions on clay. The study of these artifacts and structures allows us to characterize forestry practice, technical process of woodworking (sequence of actions, techniques and gestures), household equipment and architecture.*

***Key words**: Woodworking, carpentry, charcoal and wood analysis, forestry practice, household equipment, architecture, Iron Age, Roman Period, Northwest Iberian Peninsula.*

INTRODUCTION

This article discusses both wooden artifacts and wooden structures from Iron Age and Roman sites in the northwest of the Iberian Peninsula. The study of these pieces provides a greater understanding of how this raw material was used for woodworking. While the preservation of these types of objects and structures is rare in archaeological contexts, wood was used in many different ways in the day-to-day life of past societies: domestic, artisanal and ritual tools, weapons, structures, logboats, ships, carts, etc. (Coles *et al*. 1978; Earwood 1993; Figueiral 1996; Pugsley 2003; Bosch *et al*. 2006; Pillonel 2007; Ulrich 2007; Carrión and Rosser 2010).

Although wood, like most organic substances, rapidly perishes in temperate climates once it is buried, wooden remains can survive in waterlogged conditions, or can be preserved by carbonization, mineralization or even survive, indirectly, as impressions in clay. In the assemblages studied, whole items were most commonly preserved by water or humidity saturation, along the margins of rivers or *rías*. However, the most ubiquitous type of preservation (for fragments of items) was through carbonization as a result of burning events, where structural timbers

and wooden objects were fire-affected, or in hearths, where wooden objects were occasionally burned as fuel. Preservation by mineralization was rare in the assemblages. Even less frequent were the examples of impressions of branches on clay, which provide indirect evidence for construction in wood.

There are many references in the specialized literature about woodworking and carpentry (including structures and objects) in Iron Age settlements and Roman sites (García-Rollán 1971; López-Cuevillas and Lorenzo 1986; Silva 1986; Orero 1988; Alves *et al*. 1988-89; Carballo 2002; Carrión 2005; Martín-Seijo 2006; Alves and Rieth 2007; Vigo 2007; Martín-Seijo 2008; Carrión and Rosser 2010, Martín-Seijo and Carballo 2010; Rey *et al*. 2011). The sites considered in this study (Fig. 1) are eleven fortified settlements (*castros*) occupied during the Iron Age - Zoñán, Neixón Grande, Alto do Castro, Castrolandín, Castrovite, Montealegre, Nabás, Punta do Muiño, Coto do Mosteiro, O Castelo and Castromao-, along with two habitation sites, a *vicus* (Caldas), a *villa* (Noville), and a marine saltern (Areal), dating to the Roman period.

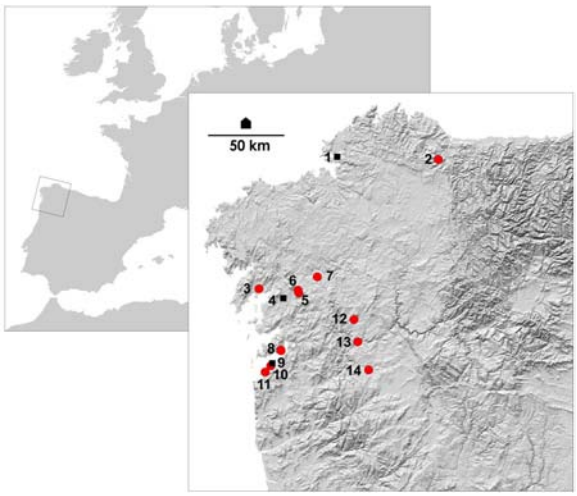

Figure 1. Location of the sites (Iron Age in red, Roman in black). 1. Noville, 2. Zoñán, 3. Neixón Grande, 4. Caldas, 5. Alto do Castro, 6. Castrolandín, 7. Castrovite, 8. Montealegre, 9. Areal, 10. Punta do Muiño, 11. Nabás, 12. Coto do Mosteiro, 13. O Castelo, 14. Castromao.

MATERIAL AND METHODS

At the macroscopic level, the technological study of the wooden artifacts consisted first in the morphometric analysis of the object: overall description, graphic recording and measuring. Indirect evidence of wooden constructions, such as clay impressions of wattle and daub structures (Cubero 1996; Nava and Fernández 2001; Gómez 2008), was also analyzed. The diameter of each impression was measured using a digital caliper. The different stages of the *chaîne opératoire* or operational sequence were then described: raw material procurement, blank and product preparation and final product. This concept considers a production process as a sequence of actions influenced by technical possibilities and personal and cultural choices (Skibo and Schiffer 2008).

During the microscopic study the samples were first identified taxonomically, according to the specific anatomical patterns on the three sections of wood (cross, tangential and radial). Several dendrological and taphonomic characteristics of the samples were also registered: part of the plant, presence of tyloses, minimum diameter, number of annual rings, season of cutting and alterations related to the taphonomic processes (fragmentation, erosion, biological action, etc.) (Crone and Barber 1981; Morgan 1988; Théry-Parisot 2001; Marguerie and Hunot 2007; Martín-Seijo and Carballo 2010).

RESULTS AND DISCUSSION

IRON AGE WOODWORKING

The charcoal assemblages recovered from the hillforts (*castros*), ranging in date from the 8th century BC to the 1st century AD, provide information about different stages of the *chaîne opératoire* of woodworking. Most of the fragments or pieces studied were final products of building material or domestic objects. It was only in Castrolandín (Cuntis, Pontevedra) that it was possible to identify a carpenter's workshop by the presence of manufacturing waste and fragments of fin-

ished objects or structures.

Oak (*Quercus* sp. deciduous) was the most common and ubiquitous taxon identified in wooden manufacture during the Iron Age, used as elements of building structures (planks, beams, wedges, laths, etc.), and for many different kinds of objects (handles and agricultural implements). Other taxa identified in lower percentages were *Corylus avellana*, Fabaceae, *Quercus* sp. evergreen, *Arbutus unedo*, *Erica* sp., *Alnus* sp., *Fraxinus* sp., Rosaceae/Maloideae, *Prunus* sp. and *Salix/Populus*. All the species identified were hardwoods and probably were available in the surroundings of the settlements.

All the information related to timber, roofing and wattle from the Iron Age samples came from burning episodes which resulted in deposits with a high concentration of carbonized organic remains. Main structural elements, such as beams and posts, were made of oak (*Quercus* sp. deciduous). In Alto do Castro (Cuntis, Pontevedra) a fire event dated to between the 5th and 4th centuries BC preserved an oak beam. At Neixón Grande (Boiro, A Coruña), from a context of similar date, a carbonized oak fence-post was found.

In Nabás (Nigrán, Pontevedra) a burning episode that affected several buildings of the settlement was identified. Wood-charcoal from this fire event was dated between the 2nd century BC and the 1st century AD. Several planks were dismantled and burned, before the construction collapsed. The results (Fig. 2) show that the taxa used for timber were mainly *Quercus* sp. including deciduous and evergreen species; other taxa, such as *Corylus avellana*, *Alnus* sp. and *Salix/Populus* probably formed part of wattle walls, while the roofing material came from Fabaceae. Other species were identified sporadically.

The assemblages recovered in Castrovite (A Estrada, Pontevedra) were related to several fire epi-

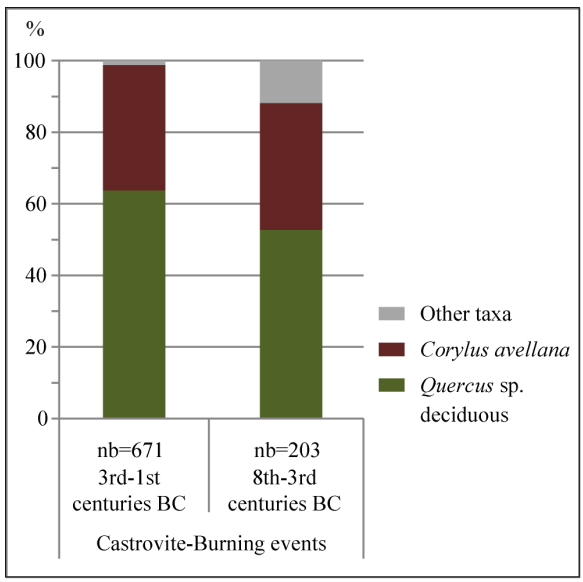

Figure 3. Taxa identified in the burning layers of Castrovite.

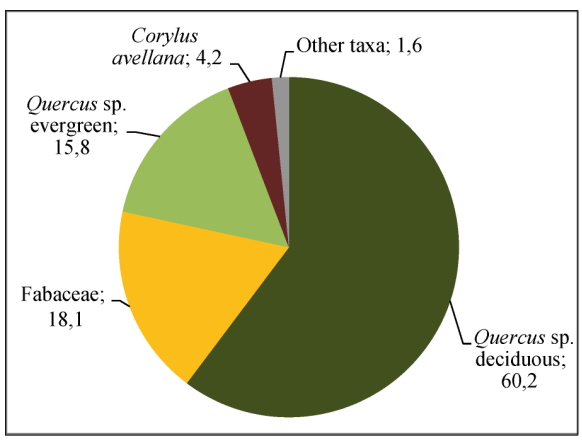

Figure 2. Percentages of identified taxa in the burning event of Nabás.

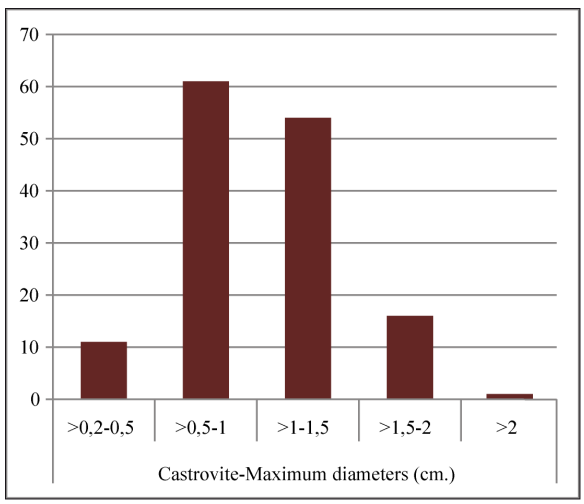

Figure 4. Maximum diameters of the hazel branches found at Castrovite.

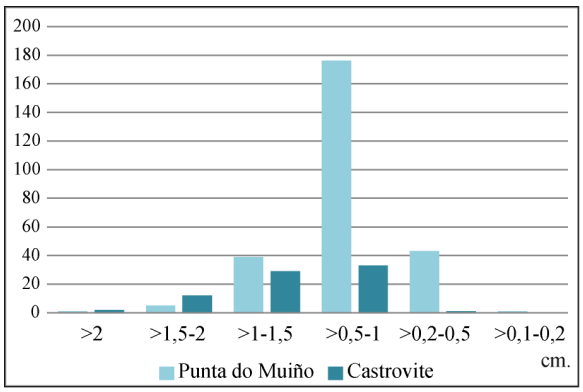

Figure 5. Maximum diameters of the impressions on clay found at Punta do Muiño and Castrovite.

sodes dated to between the 8th and the 3rd centuries BC and between the 2nd and the 1st centuries BC (Rey *et al*. 2011). In these deposits, high percentages of oak (*Quercus* sp. deciduous) were identified, including some well preserved planks, laths and wedges (Fig. 3).

Several wattle hurdle structures for cereal storage were also identified from these contexts. They were made of hazel twigs with maximum diameters of 0.5 -2 cm (Fig. 4), with the majority ranging from 0.9 to 1.6cm (Martín-Seijo and Carballo 2010). The hazel twigs were aged between 1 and 8 years (*nb* = 77). However, as growth rings are completely preserved only in the base of the trunk or base of the branch (Morgan 1988), the age could only be approximately estimated due to the fragmentary nature of the charcoal and subsequent difficulty in identifying what part of the branch they belonged to. The cutting season was predominantly during the autumn.

This pattern is also observed in O Castelo (Cenlle, Ourense), where several assemblages of branches (*nb*=75) of *Arbutus unedo, Erica* sp., Fabaceae, *Quercus suber* and *Salix* sp, most of them between 0.5 to 1 cm diameter, were identified. In this case, branches were cut throughout the year, which may be evidence of repairs of the roofing and wall structures.

The presence of wattle and daub structures in the Iron Age settlements is quite common, as is shown by the presence of small diameter, flexible twig assemblages in many sites. Their presence is also indicated at Punta do Muiño (Vigo, Pontevedra), O Castelo and Castrovite, through indirect archaeobotanical evidence as clay impressions. Measurement of the maximum diameters of these impressions showed the prevalence of branches ranging between 0.5 and 2 cm (Fig. 5).

Site	Description	Species
Castromao	Handle*	*Quercus* sp. deciduous
Neixón Grande	Handle*	*Quercus* sp. deciduous
Castrolandín	Handle	*Alnus* sp.
Montealegre	Handle	*Corylus avellana*
Zoñán	Bowl/scoop	*Fraxinus* sp.
Castrolandín	Bowl/scoop	*Alnus* sp.
Castrolandín	Bowl?	*Alnus* sp.
Nabás	Box	*Quercus suber*
Coto do Mosteiro	Hook	*Quercus* sp. deciduous
Nabás	Indeterminate	*Quercus* sp. deciduous
Alto do Castro	Indeterminate	*Alnus* sp.
Castrolandín	Waste	*Ilex aquifolium*

Table 1. Wooden objects recovered in 'castros' (*preserved by mineralization).

During the Iron Age wood was used for construction timbers as well as raw material for the manufacture of many domestic and artisanal objects, agricultural implements, weapons, etc. *Quercus* sp. deciduous, *Alnus* sp., *Corylus avellana, Quercus suber* and *Fraxinus* sp. wood was used for the manufacture of the eleven wooden objects studied (Table 1) while the manufacturing waste belongs to *Quercus* sp. deciduous and *Ilex aquifolium*.

Handles of tools and weapons were the most common wooden pieces found at the *castros*. These are likely to have been part of metal tools used in different activities and were made of *Quercus* sp. deciduous and *Corylus avellana*. These species were probably selected for their wood qualities - hardness and toughness for oak and elasticity for hazel. All of them were fragmented, two preserved by mineralization and the rest by carbonization.

Several fragments of wooden containers were

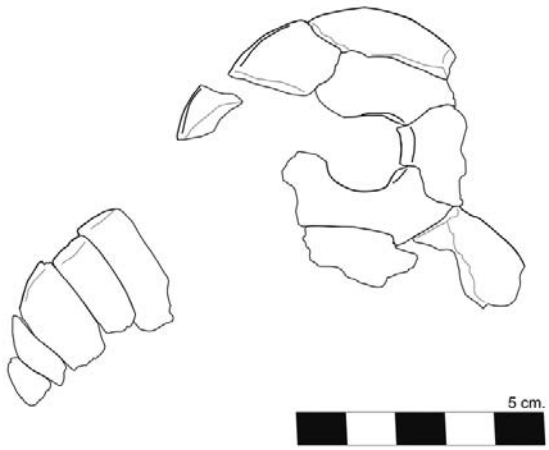

Figure 6. Handle of an indeterminate object found at Alto do Castro.

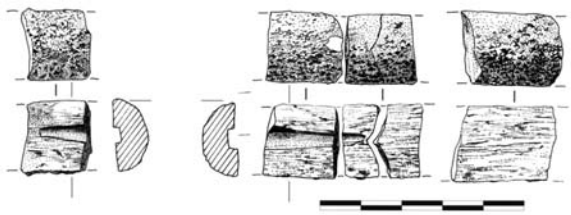

Figure 7. Manufacturing waste probably related with the use of a lathe.

identified: five of them were made of *Alnus* sp. and one of *Fraxinus* sp. The vessels found preserved the handholds and could be described as bowls or scoops. In Nabás several fragments, probably from a box, of cork (*Quercus suber)* were recovered, in association with seeds of *Panicum miliaceum*. An indeterminate object with a handle was also made of *Alnus* sp. (Fig. 6).

Few tool-marks are preserved with sufficient clarity to determine the kind of tool used. In several pieces cutmarks were identifiable. Other tool-marks include the presence of a cylindrical perforation in one piece of *Quercus* sp. deciduous from Castrovite dating to between the 4th and 2nd centuries BC, which could be related to the use of a bow drill. Manufacturing waste of *Ilex aquifolium* was probably related with the use of a lathe in a context dated between the 1st and 2nd centuries AD (Fig. 7).

ROMAN WOODWORKING

The samples recovered from the Roman sites presented a greater taxonomic variability, probably due to the nature of preservation of the wooden remains, mostly from waterlogged contexts (Areal and Caldas), with the remainder preserved by carbonization (Noville). Several waterlogged objects could not be identified because they were treated prior to sampling or because the samples were too degraded to identify the species.

In the marine saltern of Areal (Vigo, Pontevedra) many structural timbers survived in their original position in a context dating to between the 1st and 3rd centuries AD. The posts and planks which delimited the salt evaporation pond were made of *Quercus* sp. deciduous (*nb*=270), *Alnus* sp. (*nb*=7) and *Castanea sativa* (*nb*=5) (Fig. 10). In this case we could register the process by which timbers were obtained (also called conversion). The posts/planks were obtained by radial and longitudinal splitting and presented different morphologies (Fig. 8).

The posts which delimited the channel associated with the evaporation pond (Fig. 9) were made of *Cas-*

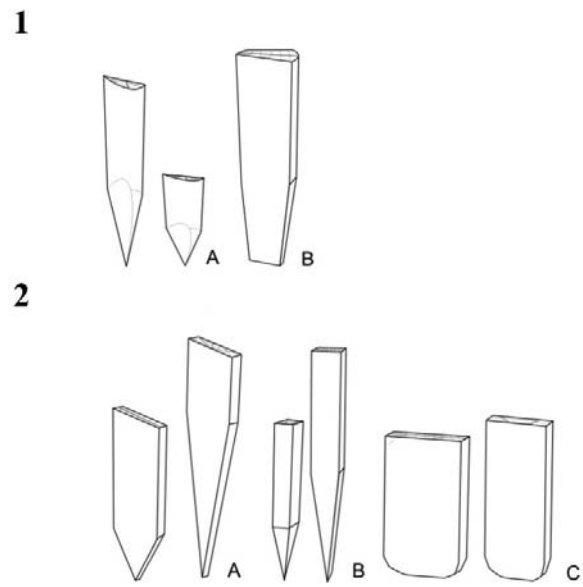

Figure 8. Posts and planks obtained by (1) radial and (2) longitudinal tangential splitting.

tanea sativa (*nb*=26), *Quercus* sp. deciduous (*nb*=21) and *Q*. sp.evergreen (*n*=1), and the wattle hurdle was also made of *Quercus* sp. deciduous (*nb*=26), *Castanea sativa* (*nb*=26) and *Frangula alnus* (*nb*=1) twigs. The diameters of these twigs were between 0.3 and 4 cm, although the predominant range was from 1 to 2 cm. The number of annual rings idenfied was from 1 to 6, the predominant range was 2-3 annual rings. The cutting season was varied. Other structural elements, such as stakes or wedges, were made of *Quercus* sp. deciduous.

Figure 9. Wattle structure of the channel associated with the evaporation pond at Areal.

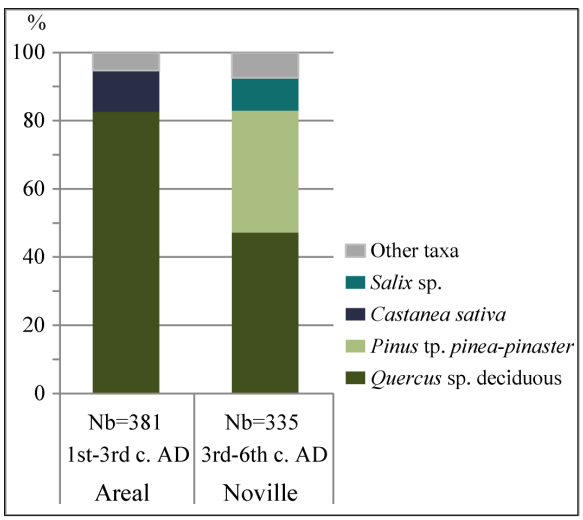

Figure 10. Taxa identified at Areal (waterlogging) and Noville (carbonization).

At the villa of Noville (Mugardos, A Coruña) a rich assemblage of wood-charcoal was recovered from a fire-affected layer. The species most used in construction were *Quercus* sp. deciduous and *Pinus pinea-pinaster* (more likely the second), but *Alnus* sp., *Corylus avellana, Fraxinus* cf. *F. excelsior*, Fabaceae and *Salix* sp. are also present (Fig. 10). The wood is highly fragmented, but it seems to originate from large-diameter elements; an exception are some small-diameter willow woods, a species highly valued for the elasticity of its twigs, which most likely formed part of a network of wattle and daub structures.

In archaeological contexts dating to between the 3rd and 5th centuries AD manufacturing waste (chips) and objects related to construction (posts, stakes, nails, plugs, wedges, planks, strips and a joinery piece), fishing (net weight and floats, corks, awls, spatula) and other activities (tray, bowl/scoop, top, etc.) were identified. The species represented in the manufacturing waste were *Quercus* sp. deciduous, *Castanea sativa, Salix/Populus, Fraxinus* sp., *Juglans regia* and Rosaceae/Maloideae. The elements related to wooden frames were made of *Quercus* sp. deciduous and evergreen, *Castanea sativa, Salix/Populus, Prunus* sp., *Pinus* tp. *pinea/pinaster* and *Pinus* tp. *sylvestris/nigra*.

Site	Description	Species
Areal	3 Awls	-
Areal	Spatula	-
Areal	Bowl/Scoop	*Fraxinus* sp.
Areal	Tray	-
Areal	2 Corks	*Quercus suber*
Areal	Top	-
Areal	Net weight	*Quercus* sp. deciduous
Areal	2 Net floats	*Quercus suber*
Areal	Indeterminate	*Castanea sativa*

Table 2. Wooden objects from Areal.

The wooden objects related to fishing and other activities were made of *Quercus suber*, *Castanea sativa*, *Fraxinus* sp. and *Quercus* sp. deciduous (Table 2).

At Caldas de Reis (Pontevedra) a wooden beam of *Quercus* was preserved associated with a level of collapse dated to between the 3rd and 4th centuries AD.

CONCLUSIONS

The analysis of these assemblages provides information on the use of wood during the Iron Age and the Roman period in the northwest of the Iberian Peninsula (Table 3). Romanization probably affected the three pillars of all craft production - raw materials, technology and social contexts (Feugère 2011; Tisserand 2011) – in different ways. Further analysis of the innovation and spread of woodworking techniques would require the investigation of a greater number of artifacts and structures.

These data show the wide range of uses to which wood was put by these communities while the wooden artifacts and timber structures provide an insight into contemporary domestic life. Although in the past many tools and household equipment would have been of wood, little is known about the use of this material due to problems of preservation on most sites. Species were selected for their physical and mechanical properties responding to the requirements of the end object in question, e.g. high quality trunks for structural elements, flexible branches for frameworks, or fine-grained wood for more finely worked objects.

The wooden frameworks indicate the presence of forestry management practices related to the production of large, straight and flexible branches. The observation of the cutting season through the presence of bark on the branches indicates that felling took place during various seasons. Ethnographic examples indicate that branches for frameworks are used when still green because of their great flexibility; but the structures could have also been repaired in various seasons of the year. The presence of *Corylus avellana, Salix/Populus* and *Castanea sativa* branches with a diameter between 1.5-2 cm, as well as the clay impressions of branches, was related to wattle hurdles and wattle and daub structures during the Iron Age and the Roman period.

Taxa/Manufactures	Iron Age		Roman	
	Timber	Tools	Timber	Tools
Quercus sp. deciduous	*	*	*	*
Fraxinus sp.	*	*	*	*
Alnus sp.	*	*	*	
Corylus avellana	*	*	*	
Quercus suber	*	*		*
Fabaceae	*		*	
Frangula alnus	*		*	
Rosaceae/Maloideae	*		*	
Salix/Populus	*		*	
Quercus sp. evergreen	*		*	
Arbutus unedo	*			
Erica sp.	*			
Prunus sp.	*			
Ilex aquifolium		*		
Castanea sativa			*	*
Juglans regia			*	
Laurus nobilis			*	
Pinus tp.*pinea/pinaster*			*	
Pinus tp.*sylvestris/nigra*			*	

Table 3. Taxa identified in wooden manufactures from Iron Age and Roman sites.

The timber requirements were met by local resources since the identified taxa were characteristic of the landscapes of Northwest Iberia during the Iron Age and Roman period and there is no evidence for the use of "exotic" wood. The widespread use of the maritime pine at Noville can probably be attributed to the plantation of these species by the Romans for wood exploitation.

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